Eno Center for Transportation

Aviation Insights

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Question: How do taxes and fees change if air traffic control is privatized?

Congress and the Trump Administration have proposed to overhaul air traffic control (ATC) in the United States by removing the ATC function from the federal government and assigning it to a non-profit private corporation.[1] Research demonstrates that this model would result in a more efficient, modern system.[2] A major aspect of the proposed reform is overhauling the current tax-based funding structure to one that is based on user fees.

Currently, each passenger pays a tax based on the cost of the ticket (7.5 percent of the ticket cost), plus a $4.10 segment fee for each flight on a trip. Airlines also pay $0.043 per gallon of jet fuel they use. One of the issues raised during the debate on ATC reform is whether user fees would lead to more expensive flights for passengers.

To determine how flyers would be affected by ATC reform, Eno compared the current approach to ATC to one used in Canada. NAV CANADA, the Canadian ATC organization, is run by a non-profit entity (similar to proposals for a reformed U.S. model) and funds itself by charging fees to the airspace users based on aircraft weight and distance.[3]

Eno selected twenty routes (Figure 4) at random, with an emphasis on large and medium hub airports since those carry over 85 percent of all domestic passengers.[4] Eno estimated the distances flown on each route, and the average fares using U.S. Department of Transportation (U.S. DOT) data from 2016, also shown in Table 1.

Table 1. Routes chosen at random for ATC comparison

Medium Hubs			
Airport 1	**Airport 2**	**Distance (miles)**	**Average fare (2016)**
Oakland	Denver	957	$190.19
San Jose	Dallas Love	1450	$188.69
Santa Ana	Oakland	371	$158.76
Hartford	Washington Dulles	326	$166.10
Indiana	San Francisco	1943	$318.30
Albuquerque	Phoenix	328	$168.78
Buffalo	Washington Dulles	283	$174.17
Columbus	Los Angeles	1995	$277.65
Dallas Love	Birmingham	587	$223.45
San Antonio	New York Kennedy	1587	$284.55

[1] *U.S. House of Representatives, "H.R. 2997 – 21st Century Aviation Innovation, Reform, and Reauthorization Act," 115th Congress, 2017.*
[2] *Neiva and Puentes, "Time for Reform: Delivering Modern Air Traffic Control," Eno Center for Transportation, 2017.*
[3] *The Canadian system reduced fees 30 percent from when they were first enacted in 1999, while also deploying new technologies quickly and involving stakeholders in governing the system. See: Neiva and Puentes, 2017; and Air Traffic Management, "Nav Canada 2017 Fees to Save Airlines $100m," Air Traffic Management, July 18, 2016.*
[4] *First, 10 medium and 10 large hubs were selected at random among their respective cohorts. Then for each of these airports a nonstop route flown from these airports during 2017 was also selected at random.*

Table 1. Routes chosen at random for ATC comparison (continued)

Large Hubs			
Airport 1	**Airport 2**	**Distance (miles)**	**Average fare (2016)**
Phoenix	Philadelphia	2075	$298.58
Denver	Columbus	1154	$230.60
Orlando	Norfolk	655	$174.53
Chicago O'Hare	Pittsburgh	413	$198.08
Chicago Midway	Norfolk	704	$200.21
Boston	Cleveland	563	$174.18
Newark	Buffalo	282	$162.78
Las Vegas	Washington Reagan	2089	$257.95
New York Kennedy	Dallas/Forth Worth	1391	$211.86
New York La Guardia	Fort Myers	1080	$188.84

Source: Office of Aviation Analysis, "Domestic Airline Consumer Airfare Report", U.S. Department of Transportation, 2017 and Great Circle Mapper (www.gcmap.com).

To estimate the taxes paid per route, the assumptions were made based on fuel consumption and passenger load (Table 2).

Table 2. Aircraft considered for ATC comparison

Aircraft	Fuel burn (gallons/mile)	MTOW* (lbs.)	Seats
Canadair CRJ200 (regional jet)	0.67	51,000	50
Embraer E190 (regional jet)	0.44	105,360	99
Airbus A320 (mainline aircraft)	1.66	172,000	150
Boeing 737-800 (mainline aircraft)	1.67	174,200	160

**MTOW=Maximum Take-Off Weight*
Sources: Aircraft specifications from Bombardier, Embraer, Airbus, Boeing

Not every aircraft flies at maximum passenger capacity, thus the average load factor for domestic flights in 2016, 84.6 percent, was used to calculate the number of passengers on each flight.[5] Additionally, not all taxes collected go to fund ATC operations: roughly one-third go to airport development, safety regulation, and other FAA functions.[6] As such, Eno estimated the "cost of ATC" for each flight to be two-thirds of the taxes collected.

Canada employs direct user fees, instead of taxes, to fund ATC. NAV CANADA fees are based on the distance travelled and the weight of the aircraft. The current fee structure includes a terminal charge and an "en-route" charge that take into account the aircraft weight and the distance flown. An exchange rate of 1 CAD = 0.75 USD was applied for comparison.[7]

Table 3 shows the current U.S. taxes collected for each flight and the estimated costs if the NAV CANADA fees were applied on the same routes. The last column shows the calculated percent difference from the American system to the Canadian system. The comparison is not intended to indicate that a reformed U.S. system would immediately apply the current NAV CANADA rates. Instead it demonstrates how different types of aircraft flying to different airports might be affected relative to one another.

[5] *Eno Center for Transportation, "Jet Fuel Prices Have Dropped Significantly. Why Haven't Ticket Prices?" Eno Aviation Insights No. 2, 2017.*
[6] *Neiva and Puentes (2017).*
[7] *For more detail and exact calculations, see: NAV CANADA, "Customer Guide to Charges—Effective September 1, 2017," 2017.*

Table 3. ATC comparison

Flight	Aircraft	Estimated U.S. Taxes per flight	NAV CANADA ATC fees per flight	Difference Canada/U.S.
Newark – Buffalo	CRJ200	$465.32	$256.48	-45%
	E190	$914.18	$446.04	-51%
	A320	$1,393.07	$649.85	-53%
	B737-800	$1,485.17	$656.26	-56%
O'Hare – Pittsburgh	CRJ200	$542.50	$279.31	-49%
	E190	$1,063.68	$478.85	-55%
	A320	$1,623.27	$691.78	-57%
	B737-800	$1,730.36	$698.45	-60%
Boston – Cleveland	CRJ200	$494.84	$305.45	-38%
	E190	$965.50	$516.42	-47%
	A320	$1,478.74	$739.78	-50%
	B737-800	$1,575.78	$746.76	-53%
Orlando – Norfolk	CRJ200	$497.36	$323.23	-35%
	E190	$968.16	$541.97	-44%
	A320	$1,485.36	$772.42	-48%
	B737-800	$1,582.59	$779.61	-51%
Midway – Norfolk	CRJ200	$552.61	$330.03	-40%
	E190	$1,076.31	$551.74	-49%
	A320	$1,650.60	$784.90	-52%
	B737-800	$1,758.71	$792.17	-55%
New York LaGuardia – Fort Myers*	A320	$1,596.37	$905.22	-43%
	B737-800	$1,699.84	$913.26	-46%
Denver – Columbus*	A320	$1,864.82	$928.91	-50%
	B737-800	$1,985.98	$937.10	-53%
New York Kennedy – Dallas Fort Worth*	A320	$1,757.20	$1,004.75	-43%
	B737-800	$1,870.53	$1,013.42	-46%
Phoenix – Philadelphia*	A320	$2,339.91	$1,223.64	-48%
	B737-800	$2,490.22	$1,233.71	-50%
Las Vegas – Washington Reagan*	A320	$2,082.78	$1,228.12	-41%
	B737-800	$2,215.92	$1,238.22	-44%
Buffalo – Washington Dulles	CRJ200	$489.44	$256.66	-48%
	E190	$961.90	$446.29	-54%
	A320	$1,465.40	$650.17	-56%
	B737-800	$1,562.32	$656.59	-58%
Hartford – Washington Dulles	CRJ200	$473.20	$264.15	-44%
	E190	$928.66	$457.06	-51%
	A320	$1,416.25	$663.94	-53%
	B737-800	$1,509.77	$670.43	-56%
Albuquerque – Phoenix	CRJ200	$478.91	$264.50	-45%
	E190	$939.93	$457.56	-51%
	A320	$1,433.37	$664.58	-54%
	B737-800	$1,528.03	$671.08	-56%

(continued)	Aircraft	Estimated U.S. Taxes per flight	NAV CANADA ATC fees per flight	Difference Canada/U.S.
Santa Ana – Oakland	CRJ200	$458.53	$271.99	-41%
	E190	$898.48	$468.33	-48%
	A320	$1,371.79	$678.34	-51%
	B737-800	$1,462.22	$684.93	-53%
Dallas – Birmingham	CRJ200	$599.53	$309.64	-48%
	E190	$1,172.17	$522.44	-55%
	A320	$1,792.55	$747.46	-58%
	B737-800	$1,910.45	$754.49	-61%
Oakland – Denver	CRJ200	$536.31	$374.12	-30%
	E190	$1,037.61	$615.12	-41%
	A320	$1,599.10	$865.86	-46%
	B737-800	$1,703.08	$873.65	-49%
San Jose – Dallas*	A320	$1,612.98	$1,023.63	-37%
	B737-800	$1,716.54	$1,032.43	-40%
San Antonio – New York Kennedy*	A320	$2,227.72	$1,067.47	-52%
	B737-800	$2,371.89	$1,076.55	-55%
Indianapolis – San Francisco*	A320	$2,458.78	$1,181.40	-52%
	B737-800	$2,617.38	$1,191.20	-54%
Columbus – Los Angeles*	A320	$2,203.31	$1,198.04	-46%
	B737-800	$2,344.73	$1,207.95	-48%

**Regional jets (CRJ200 and E190) do not fly routes further than 1000 miles*

Source: Eno Center for Transportation estimates.

The analysis shows that the NAV CANADA ATC fees are consistently less expensive than comparable taxes charged to passengers and airlines in the United States.[8] The lowest calculated difference show NAV CANADA fees are 30 percent cheaper than U.S. taxes (Oakland-Denver flight on a CRJ200).[9] The biggest difference comes from a Dallas Love to Birmingham flight on a 737-800 that would be 61 percent cheaper on the Canadian system.[10]

Overall, the results indicate that flights flown with large, mainline aircraft saw the biggest reductions when applying NAV CANADA's rates. This is due to the manner in which larger aircraft with more passengers collect more taxes, and the increased emphasis given to the distance flown in the case of Canada. While user fees increase proportionally to increases in distance, they increase less for increases in weight of the aircraft (Table 4).

Table 4. Average difference in ATC comparison by type of aircraft

Aircraft	Average difference
Canadair CRJ200 (regional jet)	-42%
Embraer E190 (regional jet)	-50%
Airbus A320 (mainline aircraft)	-49%
Boeing 737-800 (mainline aircraft)	-52%
Average	-50%

Source: Eno Center for Transportation estimates.

[8] Other reports have reached similar conclusions on the cost advantages of the Canadian system compared to the United States. For example, the Civil Air Navigation Services Organisation, a trade organization for ATC providers, concluded that the hourly costs of providing ATC in the Canada were 26 percent cheaper than in the United States. See: Civil Air Navigation Services Organisation, "Global ANS Performance Report 2016 - The ANSP View," 2016.
[9] The actual flight is operated by Southwest on a Boeing 737-800 with 175 seats, which would mean that the flight would pay three times as much in taxes.
[10] The actual flight is operated by Southwest in either a Boeing 737-300 or Boeing 737-700 with 143 seats, which would mean that in reality the flight would pay slightly less in taxes.

Fees for Cargo Aircraft

Cargo aircraft moved over 13 billion tons of packages, food, and other goods domestically in 2016.[11] Instead of ticket taxes, air cargo is assessed at a 6.25 percent waybill fee on the cost of transportation, which goes to support ATC services. Cargo airlines worry that the new fee structure could impose greater costs on them, with little benefit. While this is an important consideration, this analysis does not consider how cargo aircraft would be affected in a weight and distance fee system.

How do taxes and fees change if air traffic control is privatized?

Answers:

- NAV CANADA's air traffic control fees are significantly lower than the current tax structure used to fund the United States' system. This suggests that the Canadian model is more cost effective. Since it's inception in 1996, NAV CANADA has reduced fees by over 30 percent, not counting inflation.

- Eno's analysis shows that larger aircraft would see the most savings from a weight-distance fee structure.

- The fee structure does not take into account airport size, so smaller airports are not negatively affected with respect to larger hubs. However, flights to and from medium hub airports tend to use smaller aircraft due to the lower levels of demand, and therefore could have higher fees than destinations that attract larger aircraft.

Eno wishes to acknowledge its Aviation Working Group, a standing advisory body that provides Eno staff with guidance and expertise on all matters related to aviation policy. The opinions expressed are those of Eno and do not necessarily reflect the views of our supporters.

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[11] *Bureau of Transportation Statistics, Air Cargo Summary Data, 2016.*